# SESSION 17: BOOK VALUE MULTIPLES

Aswath Damodaran

# Price-Book Value Ratio: Definition



- The price/book value ratio is the ratio of the market value of equity to the book value of equity, i.e., the measure of shareholders' equity in the balance sheet.

  Price/Book Value = Market Value of Equity/ Book Value of Equity

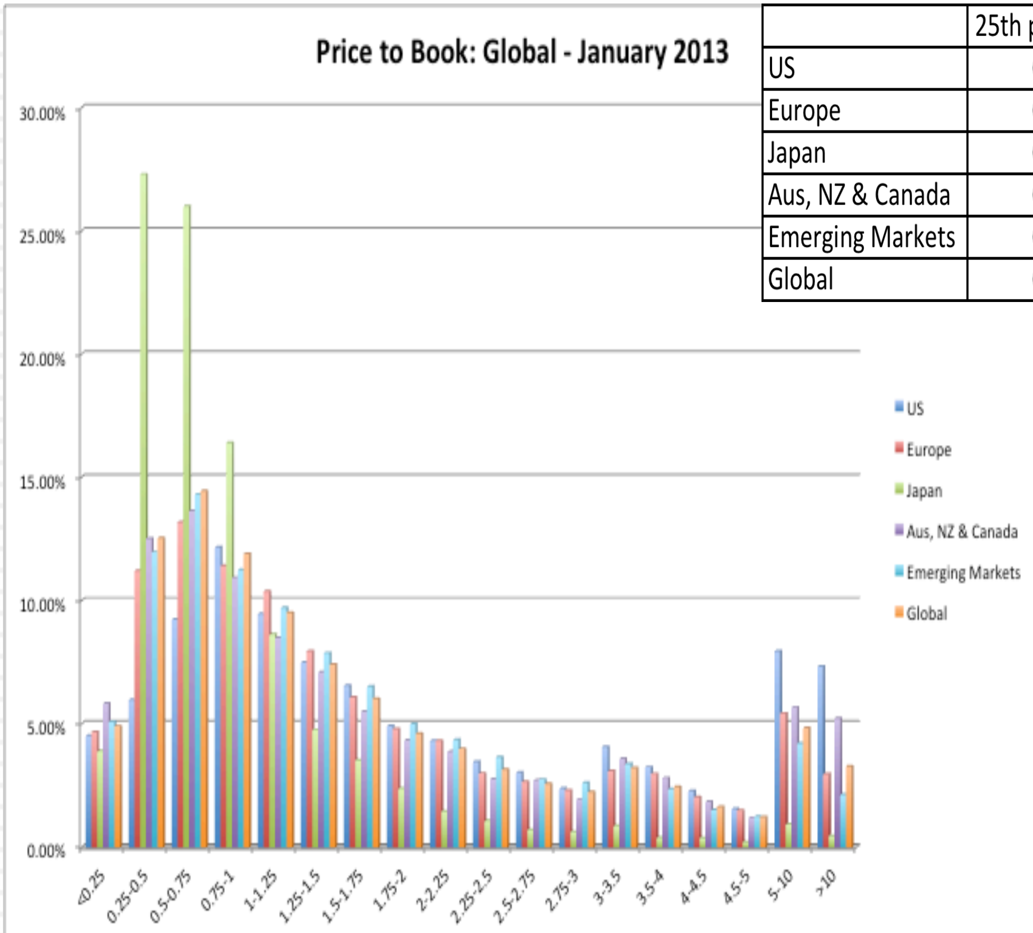
- Extending this multiple to cover broader measures of value, we get

  Value/ Book = (Market Value of Equity+ Debt)/(Book Value of Equity + Debt)

  EV/ Invested Capital= (Market Value of Equity+ Debt – Cash)/ (Book Value of Equity + Debt – Cash))

# Price to Book: U.S., Europe, Japan and Emerging Markets – January 2013






| | 25th percentile | Median | 75th percentile |
|---|---|---|---|
| US | 0.86 | 1.54 | 3.16 |
| Europe | 0.67 | 1.22 | 2.33 |
| Japan | 0.44 | 0.67 | 1.03 |
| Aus, NZ & Canada | 0.62 | 1.21 | 2.50 |
| Emerging Markets | 0.64 | 1.18 | 2.18 |
| Global | 0.63 | 1.16 | 2.23 |

# Price Book Value Ratio: Stable Growth Firm



- Going back to a simple dividend discount model,

$$P_0 = \frac{DPS_1}{r - g_n}$$

- Defining the return on equity (ROE) = EPS0 / Book Value of Equity, the value of equity can be written as:

$$P_0 = \frac{BV_0 * ROE * \text{Payout Ratio} * (1 + g_n)}{r\text{-}g_n}$$

$$\frac{P_0}{BV_0} = PBV = \frac{ROE * \text{Payout Ratio} * (1 + g_n)}{r\text{-}g_n}$$

- If the return on equity is based upon expected earnings in the next time period, this can be simplified to,

$$\frac{P_0}{BV_0} = PBV = \frac{ROE * \text{Payout Ratio}}{r\text{-}g_n}$$

# Price Book Value Ratio: Stable Growth Firm Another Presentation



- This formulation can be simplified even further by relating growth to the return on equity:

$$g = (1 - \text{Payout ratio}) * \text{ROE}$$

- Substituting back into the P/BV equation,

$$\frac{P_0}{BV_0} = PBV = \frac{ROE - g_n}{r - g_n}$$

- The price-book value ratio of a stable firm is determined by the differential between the return on equity and the required rate of return on its projects.

# Looking for undervalued securities - PBV Ratios and ROE



- Given the relationship between price-book value ratios and returns on equity, it is not surprising to see firms which have high returns on equity selling for well above book value and firms which have low returns on equity selling at or below book value.
- The firms which should draw attention from investors are those which provide mismatches of price-book value ratios and returns on equity - low P/BV ratios and high ROE or high P/BV ratios and low ROE.

# An Eyeballing Exercise: European Banks in 2010



| *Name* | *PBV Ratio* | *Return on Equity* | *Standard Deviation* |
|---|---|---|---|
| BAYERISCHE HYPO-UND VEREINSB | 0.80 | -1.66% | 49.06% |
| COMMERZBANK AG | 1.09 | -6.72% | 36.21% |
| DEUTSCHE BANK AG -REG | 1.23 | 1.32% | 35.79% |
| BANCA INTESA SPA | 1.66 | 1.56% | 34.14% |
| BNP PARIBAS | 1.72 | 12.46% | 31.03% |
| BANCO SANTANDER CENTRAL HISP | 1.86 | 11.06% | 28.36% |
| SANPAOLO IMI SPA | 1.96 | 8.55% | 26.64% |
| BANCO BILBAO VIZCAYA ARGENTA | 1.98 | 11.17% | 18.62% |
| SOCIETE GENERALE | 2.04 | 9.71% | 22.55% |
| ROYAL BANK OF SCOTLAND GROUP | 2.09 | 20.22% | 18.35% |
| HBOS PLC | 2.15 | 22.45% | 21.95% |
| BARCLAYS PLC | 2.23 | 21.16% | 20.73% |
| UNICREDITO ITALIANO SPA | 2.30 | 14.86% | 13.79% |
| KREDIETBANK SA LUXEMBOURGEOI | 2.46 | 17.74% | 12.38% |
| ERSTE BANK DER OESTER SPARK | 2.53 | 10.28% | 21.91% |

# The median test…



- We are looking for stocks that trade at low price to book ratios, while generating high returns on equity, with low risk. But what is a low price to book ratio? Or a high return on equity? Or a low risk
- One simple measure of what is par for the sector are the median values for each of the variables. A simplistic decision rule on under and over valued stocks would therefore be:
  - Undervalued stocks: Trade at price to book ratios below the median for the sector,(2.05), generate returns on equity higher than the sector median (11.82%) and have standard deviations lower than the median (21.93%).
  - Overvalued stocks: Trade at price to book ratios above the median for the sector and generate returns on equity lower than the sector median.

# How about this mechanism?



- We are looking for stocks that trade at low price to book ratios, while generating high returns on equity. But what is a low price to book ratio? Or a high return on equity?
- Taking the sample of 18 banks, we ran a regression of PBV against ROE and standard deviation in stock prices (as a proxy for risk).

| | | | | | |
|---|---|---|---|---|---|
| PBV = | 2.27 | + | 3.63 ROE | - | 2.68 Std dev |
| | (5.56) | | (3.32) | | (2.33) |

R squared of regression = 79%

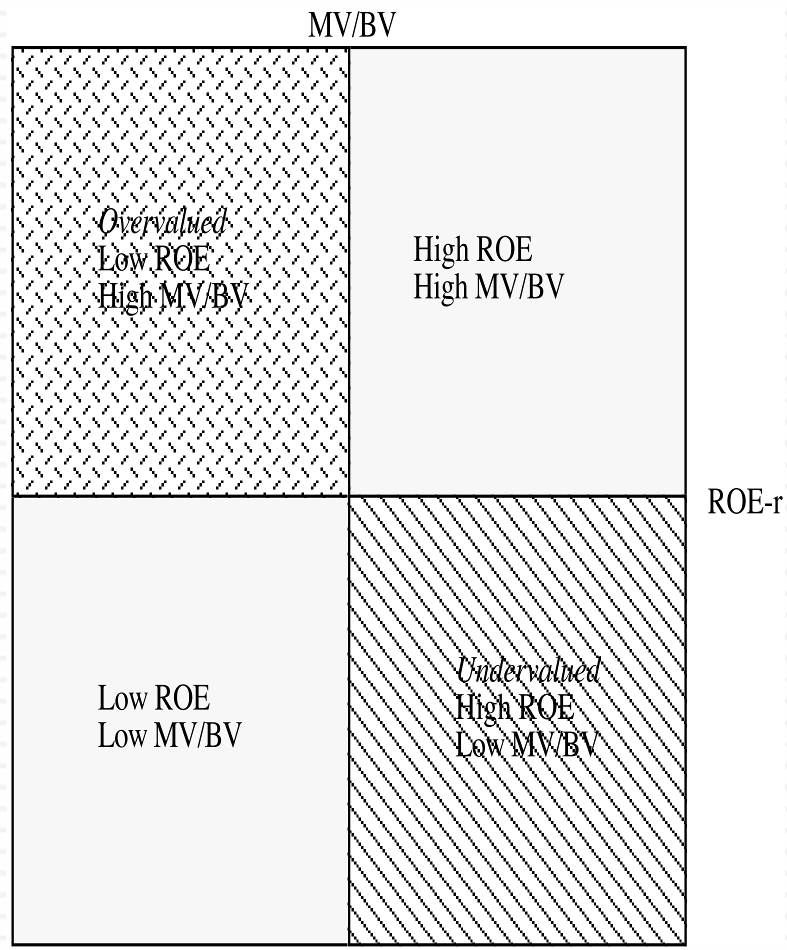
# And these predictions?



| *Name* | *PBV Ratio* | *Return on Equity* | *Standard Deviation* | Predicted PBV | Under/Over (%) |
|---|---|---|---|---|---|
| BAYERISCHE HYPO-UND VEREINSB | 0.80 | -1.66% | 49.06% | 0.89 | -10.60% |
| COMMERZBANK AG | 1.09 | -6.72% | 36.21% | 1.05 | 3.25% |
| DEUTSCHE BANK AG -REG | 1.23 | 1.32% | 35.79% | 1.36 | -9.26% |
| BANCA INTESA SPA | 1.66 | 1.56% | 34.14% | 1.41 | 17.83% |
| BNP PARIBAS | 1.72 | 12.46% | 31.03% | 1.89 | -8.75% |
| BANCO SANTANDER CENTRAL HISP | 1.86 | 11.06% | 28.36% | 1.91 | -2.66% |
| SANPAOLO IMI SPA | 1.96 | 8.55% | 26.64% | 1.86 | 5.23% |
| BANCO BILBAO VIZCAYA ARGENTA | 1.98 | 11.17% | 18.62% | 2.17 | -9.12% |
| SOCIETE GENERALE | 2.04 | 9.71% | 22.55% | 2.02 | 1.37% |
| ROYAL BANK OF SCOTLAND GROUP | 2.09 | 20.22% | 18.35% | 2.51 | -16.65% |
| HBOS PLC | 2.15 | 22.45% | 21.95% | 2.49 | -13.71% |
| BARCLAYS PLC | 2.23 | 21.16% | 20.73% | 2.48 | -9.96% |
| UNICREDITO ITALIANO SPA | 2.30 | 14.86% | 13.79% | 2.44 | -5.72% |
| KREDIETBANK SA LUXEMBOURGEOI | 2.46 | 17.74% | 12.38% | 2.58 | -4.79% |
| ERSTE BANK DER OESTER SPARK | 2.53 | 10.28% | 21.91% | 2.05 | 23.11% |
| STANDARD CHARTERED PLC | 2.59 | 20.18% | 19.93% | 2.47 | 5.00% |
| HSBC HOLDINGS PLC | 2.94 | 18.50% | 19.66% | 2.41 | 21.91% |
| LLOYDS TSB GROUP PLC | 3.33 | 32.84% | 18.66% | 2.96 | 12.40% |

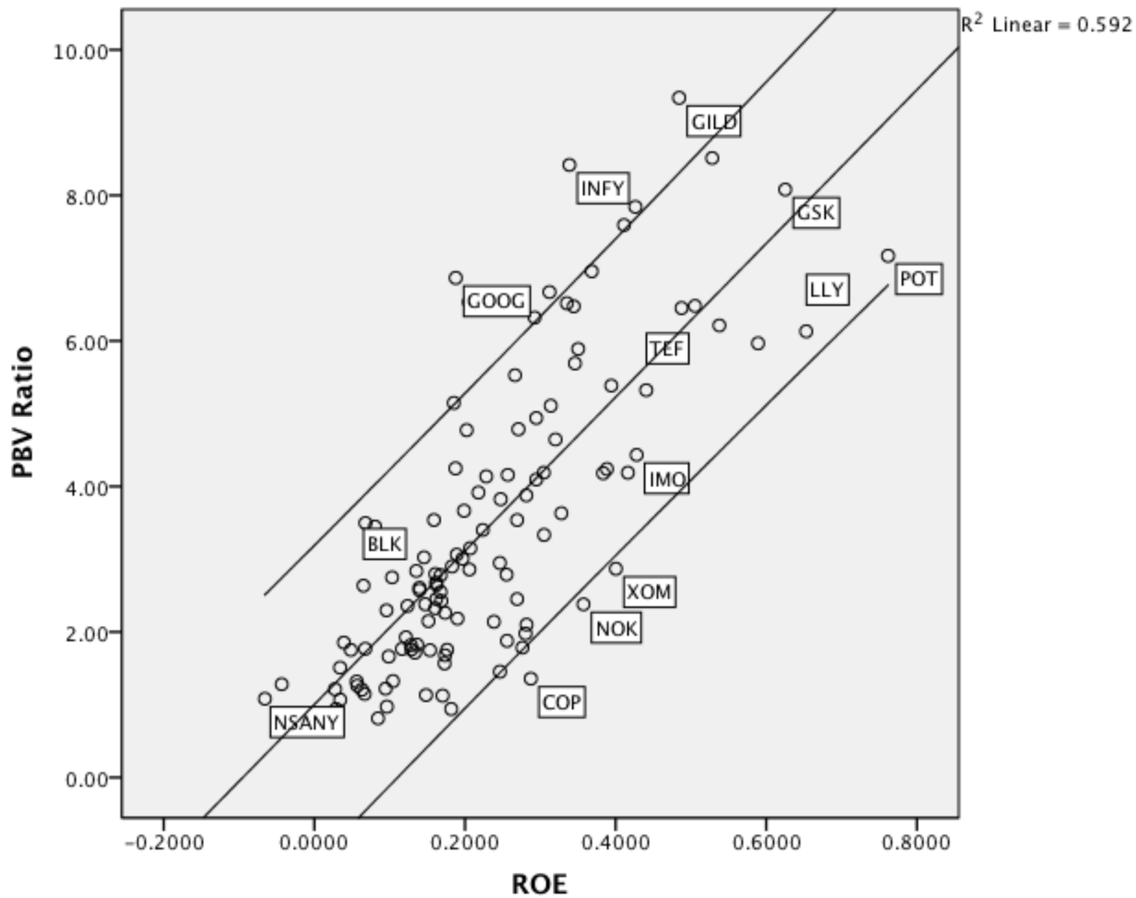
# The Valuation Matrix





# Price to Book vs ROE: Largest Market Cap Firms in the United States: January 2010





# Bringing it all together… Largest US stocks



**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .819[a] | .670 | .661 | 1.19253 |

a. Predictors: (Constant), ROE, Expected Growth in EPS: next 5 years, Regression Beta

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | .406 | .424 | | .958 | .340 |
| | Regression Beta | -.065 | .253 | -.015 | -.256 | .799 |
| | Expected Growth in EPS: next 5 years | 9.340 | 2.366 | .228 | 3.947 | .000 |
| | ROE | 10.546 | .771 | .777 | 13.672 | .000 |

a. Dependent Variable: PBV Ratio